

WHAT IS CLAIMED IS:

1. A controllable damping force shock absorber comprising:

a cylinder in which a variable viscosity fluid is sealably contained;

a piston slidably disposed in the cylinder in a fitted relationship;

a piston rod having one end connected to the piston and the other end extended to the outside of the cylinder; and

a damping force-controlling mechanism for generating a controlled damping force by controlling a flow of the variable viscosity fluid caused by slidable movement of the piston,

the damping force-controlling mechanism including:

a damping valve having a pressure-receiving portion for receiving a pressure of the variable viscosity fluid in at least one of an extension stroke and a compression stroke of the piston rod,

a pilot chamber provided behind the pressure-receiving portion, wherein a pressure in the pilot chamber is applied in a direction for closing the damping valve, to thereby control the damping valve;

a pilot passage for allowing the variable viscosity fluid to flow through the pilot chamber according to slidable movement of the piston; and

viscosity-changing means adapted to change viscosity of the variable viscosity fluid flowing

through the pilot passage.

2. A controllable damping force shock absorber according to claim 1, wherein the pressure-receiving portion includes an extension-stroke pressure-receiving portion for receiving the pressure of the variable viscosity fluid in the extension stroke of the piston rod and a compression-stroke pressure-receiving portion for receiving the pressure of the variable viscosity fluid in the compression stroke of the piston rod.

3. A controllable damping force shock absorber according to claim 1, wherein the viscosity variable fluid is a magnetic fluid and the viscosity-changing means comprises a coil which generates a magnetic field acting on the magnetic fluid flowing through the pilot passage.

4. A controllable damping force shock absorber according to claim 1, wherein the viscosity variable fluid is an electrorheological fluid and the viscosity-changing means comprises electrodes which generate an electric field acting on the electrorheological fluid flowing through the pilot passage.

5. A controllable damping force shock absorber according to claim 2, wherein the viscosity variable fluid is a magnetic fluid and the viscosity-changing means comprises a coil which generates a magnetic field acting on the magnetic fluid flowing through the pilot passage.

6. A controllable damping force shock absorber according to claim 2, wherein the viscosity variable fluid is an electrorheological fluid and the viscosity-changing means

comprises electrodes which generate an electric field acting on the electrorheological fluid flowing through the pilot passage.

7. A controllable damping force shock absorber according to claim 2, wherein the viscosity-changing means has portions provided in the pilot passage on opposite sides of the pilot chamber.

8. A controllable damping force shock absorber according to claim 2, wherein the damping force-controlling mechanism provides reverse damping force characteristics in which when soft damping is generated in one of the extension stroke and the compression stroke, hard damping is generated in the other stroke.

9. A controllable damping force shock absorber according to claim 2, wherein the damping force-controlling mechanism includes a single damping valve and a single pilot chamber.